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CITATION:

Tanaka, Koji. Agricultural Development in the Broad Depression and the Plain of Reeds in the Mekong Delta : Conserving Forests or Developing Rice Culture?(<Special Issue>Land-Use Development in the Mekong Delta in the Twentieth Century). 東南アジア研究 ...

ISSUE DATE:

2001-06

URL:

<http://hdl.handle.net/2433/56777>

RIGHT:

Agricultural Development in the Broad Depression and the Plain of Reeds in the Mekong Delta: Conserving Forests or Developing Rice Culture ?

TANAKA Koji*

Abstract

Among various agro-ecological units in the Mekong Delta of Vietnam, the Broad Depression and the Plain of Reeds had long remained unused for agricultural purposes due to adverse environmental conditions such as deep flooding, poor soil-nutrition and potential acid sulfate soil. Despite these conditions, rice cultivation expanded to a great extent in both areas after the end of the Vietnam War.

Under the new postwar socialist regime in the South, the government promoted the exploitation of these areas. Excavation of canals and construction of canal networks provided migrants with a place for settlement and the fresh water from the Mekong River enabled them to reduce the potential acidity by washing away the active acid emerging after land reclamation. As this process proceeded, spontaneous pioneer farmers rushed to these areas to reclaim rice fields prior to the implementation of the government's socialist land reform program. As a result, the former grass-and-forest wetlands have been almost completely converted into rice fields.

Since the end of 1980s, however, a debate has arisen about wetland conservation. This coincided with the "privatization" of the agricultural production system, the introduction of "*doi moi*," new economic policy in Vietnam, and the partial success of rice growing in these areas. The government has enclosed wide areas as natural reserves where *Melaleuca*, an original species of vegetation, and secondarily emerged aquaflora are preserved. On the other hand, under the pressure of rapid population growth, both the pioneer settlers and new migrants still seek to extend and intensify rice cultivation in these areas.

I Introduction: The Last Frontier of the Mekong Delta

The Mekong Delta, an area of about 50,000 km² in the lower reaches of the Mekong River, is the most important and productive rice growing area in Vietnam. Although it had long been inhabited by the Khmer and the Vietnamese peoples, it was only in the mid-eighteenth century that the Vietnamese kingdom began to advance its frontiers into the delta. By the early nineteenth century, the Vietnamese kings had conquered and pacified the delta by digging canals and establishing military (farm soldier) settlements in this low-lying area. After the French arrived in the delta in 1867, the colonial government excavated a number of great canals. Although they were built primarily for the purpose of maintaining security and developing transportation, the latter half of the century saw a considerable expansion of rice cultivation in the delta, particularly in the central part along the Tien Giang and the Hau Giang, two main tributaries of the Mekong River.

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After 1900, additional canal construction by the colonial government not only as a means of transportation but also as a means of reclaiming land, further accelerated the expansion of rice cultivation in the delta. By the Great Depression of the 1930s, most of the Mekong Delta, except for the Broad Depression and the Plain of Reeds, had been converted to arable land consolidating this region's position as the rice bowl of French Indochina [Takada 1984].

Among the agro-ecological units in the Mekong Delta, the Broad Depression and the Plain of Reeds, swampy lowlands located in the southwest and northeast, respectively, had long remained agriculturally unused because of adverse environmental conditions, such as deep flooding in the rainy season, poor soil-nutrition and potential acid sulfate soil [Nguyen Huu Chiem 1993]. After the Second World War, these areas became frontier zones where the South Vietnamese government and the resistance and liberation forces confronted each other. It was just after the end of the Vietnam War in 1975 that the areas began to be exploited to a great extent in order to develop rice cultivation. The vegetation in these areas was quickly cleared, not only by government agencies but also by pioneering spontaneous migrants from other areas in the delta. Despite the adverse conditions, the Broad Depression and the Plain of Reeds thus provided the Vietnamese people a last frontier to be exploited. After Brocheux's phrase, to the Vietnamese the Mekong Delta was what the American West was to the United States [Brocheux 1995: 209], the exploitation of the Broad Depression and Plain of Reeds after the Vietnam War was the final stage of the Vietnamese advance into the deltaic frontier.

II Exploitation of the Last Frontier

1. *Prior to the Vietnam War*

The Broad Depression and the Plain of Reeds were geologically formed by transgression and regression of the sea in the Holocene period [Nguyen Huu Chiem 1993]. The Broad Depression occupies a large area in the southwestern part of the delta, encompassing Minh Hai province and parts of Hau Giang and Kien Giang provinces. It is very flat and low (about 0.5 to 1 meter above sea level), although it is nearly isolated from the delta's hydrological system, and it contains potential acid sulfate soil derived from marine deposits during the periods of transgression. Therefore, it is very prone to flooding in the rainy season and to saltwater intrusion and acid emergence in the dry season. The two lowest areas in the Broad Depression, U Minh Thuong and U Minh Ha, contain thick peat deposits on which *Phragmites* grasslands and *Melaleuca* forests were dominantly distributed.

The Plain of Reeds is a closed, broad floodplain of the Mekong River, encompassing the northern parts of Dong Thap and An Giang provinces. As it is enclosed by sand ridge in the east, natural levees of the Tien Giang River in the southwest and the old alluvial

terrace in the north, it resembles a big, saucer-shaped, shallow lake in the rainy season. The water level can rise to three meters, and natural drainage is very difficult and slow. It also contains potential acid sulfate soil. Therefore, once after the soil is oxidized through digging or tilling, the potential acidity is very easily activated. Although most of the area is under cultivation today, it was originally covered with *Phragmites*, *Melaleuca* and *Eleocharis*, of which the latter two can tolerate strong acidity.

Despite deep flooding and acid sulfate soil, some parts of these areas were utilized as rice fields. In case of the Plain of Reeds, people living on the natural levees along the Tien Giang River reclaimed rice fields sporadically in places where flood and acid damage was not so much observed. Seasonal rice, such as floating rice or deep-water rice, which could tolerate deep flood was grown once a year in the rainy season. Rice growing was practiced under a system similar to shifting cultivation, because farmers had to abandon these fields when the acidification occurred. Another subsistence activity was freshwater fishing. When the rainy season was almost over, a huge volume of fresh water began to recede through natural streams on which seasonal migrants temporarily settled and installed fishing traps to catch a variety of fish, such as catfish, snakehead and carp.

The situation of the Broad Depression was similar, though reclamation of rice fields was more advanced than in the Plain of Reeds. However, the western and southern parts of the area were not converted to rice fields due to deep flooding and salinity intrusion. In particular, U Minh Thuong and U Minh Ha were covered with thick *Melaleuca* forests and a thick layer of peat because they were submerged almost throughout the year. People who opened rice fields in the Broad Depression had to struggle with salinity intrusion. They adapted by growing early-maturing varieties of rice in the rainy season to avoid the salinity that remained in the early stage of the rainy season and appeared again in the late stage. Freshwater and brackish-water fishing was another subsistence economy in this area.

Besides rice cultivation and fishing, bee-honey gathering in the *Melaleuca* forests, hunting wild birds and mice, and collecting timber and fuelwoods were important sources of additional income in both areas. Although the rich biodiversity was utilized by settlers and seasonal migrants in the Plain of Reeds and the Broad Depression, it was not so excessively exploited as to face extinction.

2. Construction of Strategic Villages

After the Second World War, both areas became frontiers between the resistance forces and the French colonial government, and later the South Vietnamese government. The resistance forces established forest villages (*lang rung*) in the Plain of Reeds and the Broad Depression to hide from the French army. After the division of Vietnam in 1954, the South's government, led by Ngo Dinh Diem, began to extend its role into these areas. Taking lessons from the failure of the resettlement program called *agroville*, the government launched a resettlement program called "strategic village" against resistance and

liberation forces all over South Vietnam. In An Giang province, which contained the Plain of Reeds at that time, 495 strategic villages were planned, of which 246 were completed and 138 were under construction as of January 1963 [Osborne 1965: 28].

In the Plain of Reeds, for example, strategic villages were established along canals excavated in the late 1950s: seven villages from Campus I to VII along Dong Tien canal and five villages from Campus VIII to XII along Phu Hiep canal. They were protected by military force, and many refugees from northern and central Vietnam were resettled with new migrants from within the delta. The canals were primarily excavated for the purpose of transportation and defense of the frontiers, but they also functioned to promote expanding rice cultivation because they supplied a huge volume of fresh water from the Mekong River to the lowlands. In particular, the fresh water supply was significant for the settlers because it enabled them to wash away the acid emerging through the oxidization of the subsoil. This newly created circumstance enabled people to settle there for a longer time and to convert wider areas into rice fields.

An old man who settled in one strategic village along Phu Hiep canal, presently located in Tam Nong district of Dong Thap province, spoke about his experience:

I was born the son of a poor farmer in Cantho, and moved to many places in the delta to seek job opportunities as an agricultural laborer. When I was in An Giang province at the age of 40, I happened to hear from my friend about the campaign calling settlers to strategic villages, and immediately responded to the call in 1963. When I came to the location, two villages established side by side along Phu Hiep canal received us, eight villages had already been established along Dong Tien canal, which was dug earlier than the Phu Hiep, and additional three villages were under construction along the Phu Hiep. Every village consisted of about 200 households of migrants, and every household was provided with two hectares of rice field and substantial aid for survival, such as rice, salt, sugar and agricultural equipment, for four years after the settlement. The condition of the field allocated to the settlers was not that of rice field; it was just swamp grassland covered with *mon moc* (*Ischaemum indicum*), *lua troi* (*Oryza rufipogon*: wild rice) and others. I began to open rice fields by myself, and got the first harvest of 300 kg of rice in total. As it was not enough to feed my family, grains of wild rice were also collected as a supplement.

As this story indicates, livelihood in strategic villages was neither easy nor stable. However, step by step, the grasslands surrounding the villages were converted to rice fields. Although population growth was not stable because of the occurrence of large floods, acid emergence and anti-government guerrilla attacks, it was remarkable that during the Ngo Dinh Diem regime a considerable amount of rice land was reclaimed in the Plain of Reeds and the Broad Depression.

3. Socialist Reforms after the War

The greatest change in land use, which took place immediately after the end of the Vietnam War, was the socialist reform of the landholding and production systems introduced by the new government. Rice fields owned by largescale farmers or absentee landlords were distributed to smallscale or landless farmers, and a system of collectivized labor was introduced. Although collectivized labor proved impractical among local farmers who had settled in the Plain of Reeds and the Broad Depression, it was strictly applied to the state farms established by the government.

Largescale state farms were established as a model for propagating the socialist production system, not only in the Plain of Reeds and the Broad Depression, but in the entire delta. By consolidating unused lands and individually owned arable lands

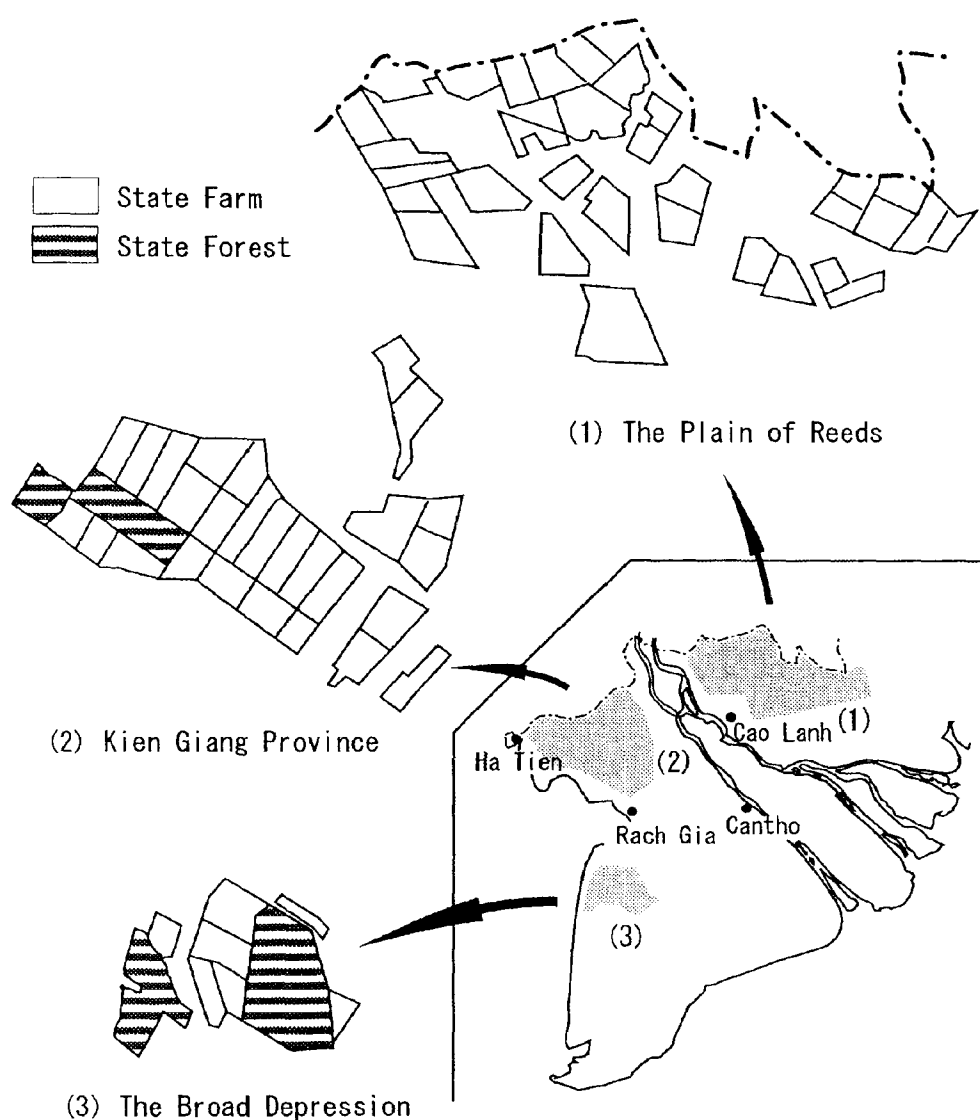


Fig. 1 Distribution of State Farms in the Broad Depression and the Plain of Reeds

Source: Personal communication and field observation

Table 1 Total Area Planted with Rice and Damaged by the Acid, and Total Production of Rice in a State Farm in Kien Giang Province, 1980-86

Year	Area Planted (ha)	Area Damaged (ha)	Total Production (ton)
1980	2,624	850	1,850
1981	2,533	850	1,000
1982	1,790	300	1,000
1983	1,470	—	1,448
1984	1,311	350	981
1985	834	—	677
1986	637	—	502 *

Source: The record kept by a staff of the state farm.

* The figure includes the production of sweet potato.

located within the planning sites, state farms of thousands of hectares per unit were established. In many cases, farmers who owned the lands on the sites were forced to release them and move to other places with compensation or the provision of new lands. In their place, government-supported migrants, mainly from the north, were resettled there. The primary and urgent purpose of establishing state farms was to develop rice cultivation to feed the increasing population of unified Vietnam. However, it was not easy task to establish rice cultivation in state farms in the Plain of Reeds and the Broad Depression, not only because the production system did not function efficiently, but also because the condition of the land was worse than in other areas. As earlier settlers had already occupied lands of comparatively better condition, the placement of state farms was restricted to lands highly prone to deep flooding, acid emergence, and/or salt intrusion.

Despite such difficulties, many state farms were established in the Broad Depression and the Plain of Reeds. As shown in Fig. 1, state farms occupied most of the Plain of Reeds, except for the locations with better conditions, such as those near canals and at higher elevations, in which local villages succeeding former strategic villages and settlements of earlier migrants were well established. In the Broad Depression, after spontaneous migrants exploited and denuded the original vegetation to cultivate rice, a vast area of 21,400 hectares was enclosed to establish and conserve *Melaleuca* forests, and a number of state farms were established in the surroundings. In addition to these areas, many state farms were established in the coastal plain of northwestern Kien Giang province, from Rach Gia to Ha Tien. This area was also highly prone to salt intrusion and acidification.

An old man who retired from the staff of a state farm in Kien Giang province told this story about the early stage of the farm:

About 550 members of the Youth Union with 15 administrative and 50 technical staff including

me were sent to this state farm established along Kien Hao canal in 1977. Members included both men and women, and all of them came from northern and central Vietnam. The farm enclosed 4,400 hectares of land, though part of it used to be cultivated by earlier settlers, excavated the secondary canals, and leveled the land using mechanical powers. We received additional newcomers, 200 households, from the north in 1981. Rice cultivation was tried from the first year of our settlement, but the attempt was a complete failure because the settlers from the north did not know about the emergence of acid.

From the second year we began to introduce local varieties of rice and adopted the same methods as the local farmers did. The total cultivated area increased year by year, but since 1980 it has begun to decrease. As my record [see Table 1] kept in those days indicates, a considerable part of the cultivated area was badly damaged by acid and this influence lasted for long time. Although a large area was enclosed, it was too large for the state farm to manage. Even at the peak of cultivation in 1980, almost half the farm acreage could not be cultivated with rice and about one third of the total planted area was severely damaged by the emergence of acid. In addition, due to the gradual decrease of government subsidies and the inefficiency of the collectivized labor system, the activity of farm management has declined markedly.

Many state farms, except for those located in areas with comparatively favorable conditions, faced similar difficulties, and with the introduction of *doi moi*, the new economic policy, many were finally closed and the farm lands were distributed to the members. In case of the state farm mentioned above, out of 4,400 hectares of initial enclosure, about 1,400 hectares were still operated by the state farm in 1986, prior to *doi moi*, while the rest had been returned to local villages. Under the *doi moi* policy, the land was distributed to every household in accordance with its potential labor force, at an average of two hectares per household. Although the state farm tried to sustain its administration and farm operations as a production cooperative, its activities ceased completely and it was finally closed in 1997.

4. *Inflow of Migrants*

There still remained vast unused grasslands and forests in 1975. Immediately after the cease-fire, when these areas were no longer battlefield frontiers, spontaneous migrants rushed in to open new rice fields so they could claim land title before the introduction of the socialist system. Even soldiers retired from the National Liberation Front of South Vietnam and from the southern government's army began to reclaim the grasslands, because they had adapted to farming swamp lowlands during the war.

Spontaneous pioneer settlers could reclaim land without any restriction because local governments were not thoroughly organized after the cease-fire. For example, a settler living now in Phu Xuan hamlet (*ap*), Phu Duc village (*xa*), Tam Nong district, in the Plain of Reeds related that he was free to open as much grassland as he could when he settled there in 1980. He said that one could open more than ten hectares, if one wanted,

just by cutting and burning the grasses. Seasonal floating rice was grown using the broadcasting method, but it was difficult to attain a harvest at the initial stage of reclamation due to acid emergence and rat attacks. After the 1982 completion of Phu Duc canal, which cut through the present Phu Xuan hamlet, an increasing number of migrants came every year from nearby districts and provinces to settle on both sides of the canal and reclaim grassland.

Government-sponsored migrants soon joined spontaneous settlers. As the socialist administration became more organized, migrants who responded to the government's recruitment campaign for the Plain of Reeds increased in the mid-1980s. Settlers were given a land allocation according to household size, usually two hectares per one labor unit, by the village people's committee. In addition, group migrants came to the Plain of Reeds through agreements between provincial governments.

With the inflow of these migrants of various backgrounds, the Plain of Reeds was almost entirely reclaimed by the time the *doi moi* policy was launched. Thus, there was no longer land available to be freely settled in the Plain of Reeds, and the same situation was observed in the Broad Depression.

III *Doi Moi* and After

1. *Intensification of Rice Cultivation*

Many canals excavated by the central and provincial governments after socialist reform paved the way for great progress in rice cultivation in the Plain of Reeds and the Broad Depression. In addition, the introduction of high yielding varieties (HYVs) of rice played an important role in expanding rice cultivation in these areas.

The HYVs, which came to be called *Than Nong* (agricultural god), were first introduced to the Mekong Delta in 1968 and brought about a noticeable change in traditional rice cultivation and rice-based cropping systems [Tanaka 1995]. They were adopted in the central part of the delta, such as Long An and Cantho provinces, at the initial stage of introduction and were gradually disseminated to the periphery of the delta. In the Plain of Reeds and the Broad Depression, their adoption was delayed for quite a long time due to adverse environmental conditions. For example, the former strategic village in Dong Thap province introduced HYVs in 1979, and it was only in the mid-1980s that the state farm discussed above in Kien Giang province introduced them. Although local people and settlers knew about HYVs, the soil and water conditions did not allow them to adopt the high yielding varieties. They had to wait for the complete disappearance of acid through consecutive washings with the fresh water available from the new canals.

The introduction of HYVs triggered a quick change in rice cropping patterns. Pump irrigation made double cropping of rice possible within several years of the introduction of HYVs. The former pattern, single cropping of local varieties of seasonal floating rice,

has been almost completely replaced by double cropping of HYVs, combining the *he-thu* (summer-autumn) and the *dong-xuan* (winter-spring) rice. The exceptions are in some areas highly prone to deep flooding, where only *dong-xuan* rice is grown. The increase both in productivity, through double cropping, and production stability, through the completion of canal networks, has stimulated the villagers to expand and intensify rice cultivation to a greater extent than before.

Table 2 shows changes in rice cultivation in Dong Thap province. At the provincial level, HYVs had been introduced to some extent prior to the end of the war, but remarkable progress was achieved only with *doi moi*. In striking contrast, local rice, which is floating rice or deep-water rice grown in the rainy season, decreased markedly in this period and had almost disappeared by the mid-1990s. According to a provincial agricultural officer, not only the "privatization" of land holding but also various technical improvements contributed immensely to the quick replacement.

In Phu Xuan hamlet, as already mentioned, at the initial stage of settlement migrants practiced direct-sowing by broadcasting the seeds of local rice. However, as the water supplied through Phu Duc canal reduced soil acidity and enabled pump irrigation in the dry season, the local government began to recommend that villagers introduce *dong-xuan* rice cultivation. As HYV cultivation increased, villagers began to construct levees or bunds on the border of their field plots, which in turn accelerated the use of chemical fertilizers, inevitable in growing HYVs. After their success in growing *dong-xuan* rice, they began to introduce *he-thu* rice with more intensive pumping and established double cropping by the early 1990s. The growing season of double cropping was quite different from that of local rice. The local rice was grown under conditions of deep flooding in the rainy season, while the *dong-xuan* rice was grown after the flood receded and the *he-thu* was grown immediately after the harvest of *dong-xuan* and harvested before the flood took place. However, the construction of dikes with material derived from the excavation of dense canal networks and the increasing construction of levees began to induce a delay of discharge from the Plain of Reeds, and this change in

Table 2 Cultivated Area and Production of Rice in Dong Thap Province, 1976–96

Year	Seasonal Rice			<i>Dong-xuan</i> Rice		
	Cultivated Area (ha)	Production (ton)	Yield (ton/ha)	Cultivated Area (ha)	Production (ton)	Yield (ton/ha)
1976	142,000	235,000	1.65	30,615	116,337	3.80
1980	110,000	193,000	1.75	72,659	222,344	3.06
1985	88,500	69,300	0.78	71,216	358,184	5.03
1990	15,142	32,071	2.12	141,903	772,833	5.45
1994	—	—	—	170,096	978,586	5.75
1996	477	1,731	3.63	189,267	1,127,220	5.96

Source: Provincial Agricultural Extension Office of Dong Thap

hydrological conditions raised difficulties in draining the seasonal submersion of the fields. The villagers were forced to postpone sowing the *dong-xuan* rice, leading to a delayed harvest; this delay in turn threatened the timely sowing of *he-thu*. To cope with this difficulty, the villagers introduced a new method of sowing *dong-xuan* rice in 1992: *sa ngam* direct-seeding under deep inundation. As they did not have to wait until the complete recession of flood waters, the new method was rapidly disseminated and adopted.

As this case shows, the expansion and intensification of rice cultivation can be ascribed to close interaction between migrants and their environment; through such interactive adaptation to changing environments, rice cultivation has developed to such an extent as to result in the eventual shortage of unused land for exploitation.

2. *Inflow of a New Type of Settler*

When the Plain of Reeds and the Broad Depression had been almost completely exploited, a new land policy recognizing individual land-use rights was implemented as a part of *doi moi*. In case of Phu Duc village, the village people's committee gave the direction to readjust the size of landholdings among villagers. The land of large-scale holders, mostly pioneer settlers who had *de facto* ownership, was divided and partly redistributed to late-coming migrants who held only a patch of farm land. Although the local government had tried to redistribute pioneer settlers' lands several times in the past to provide new migrants with substantial farm lands, redistribution schemes directed by the local government were halted after individual land-use rights were formally recognized. The shortage of unused land which became evident soon after *doi moi* started made such institutional redistribution difficult.

The coincidence between the implementation of new land policy and the partial success of double cropping also altered the valuation of farm land, which was increasingly recognized to be a valuable property, not only for subsistence but also for investment purposes. The remarkable increase in the productivity and stability of rice cultivation, which took place subsequent to *doi moi*, brought added attraction to the Plain of Reeds and the Broad Depression and induced a new type of migrant to come and settle. They came to purchase land operated by the original migrants and to apply more intensive rice cultivation. Among the twenty-one interviewees who operated rice cultivation in Phu Xuan hamlet in 1997, almost half, ten in total, came in the 1990s after purchasing land in the hamlet. Many of them came from Cao Lanh, the provincial capital of Dong Thap, and had experience working in commercial sectors or in government services and still maintained jobs and/or households. Including these newcomers, Phu Xuan hamlet, with a total area of 1,093 hectares, contained 535 households with a population of 1,605 in 1996 (according to the village people's committee).

As this case shows, the former, invisible inequality in land holding came to be easily and directly visible after *doi moi*, and this differentiation seems likely to

increase in the future.

3. *Expansion of Melaleuca Plantation and Conservation of Lowland*

In addition to this great progress in rice cultivation, the government began to implement a reforestation scheme in the late 1980s in order to preserve the swamp lowland and to develop cash-earning commodities. Following the recommendation that lands unsuited to rice growing be planted with *Melaleuca*, some state farms decided to convert their rice fields. In the case of a state farm in Dong Thap province which had been established in 1976 with an area of about 5,000 ha, about 600 ha of land were planted with *Melaleuca* by 1993, of which 60 ha was planned to be cut for timber annually under the ten-year rotation system.

As *Melaleuca* forests had provided base camps for liberation armies during the war, the implementation of reforestation was not merely an economic issue, but also had political significance. It strongly implied that the plantation scheme was a revival movement to enhance the revolutionary spirit of the liberation armies. To sustain or commemorate that spirit, *Melaleuca* plantation was strongly promoted in some state farms.

A good example can be seen in the state forest in Kien Giang province, which enclosed about 21,400 hectares of land located in U Minh Thuong, the central part of the Broad Depression. This state forest was originally established as a state farm where rice cultivation was initially attempted. However, due to thick peat deposits and potential acidification, rice cultivation was not successful. In addition, as the state farm was also too large to maintain, people came onto it illegally from surrounding areas and nearby provinces to temporarily grow rice in a plunderous manner: repeated burning, short-term cultivation and subsequent abandonment. As peat deposits could be easily burnt in the dry season, most of the state farm was quickly converted to *Phragmites* grassland and the original *Melaleuca* forest remained just in the central part of the farm.

The central government decided to convert this farm into a state forest consisting of an agro-forestry zone and a forest-reserve zone. Thus, it began to excavate two main canals, the outer and inner "polders," encircling the entire area and the forest reserve in the central part, respectively, in 1990. After the completion of canal digging in 1992, new settlers began to be recruited to manage the agro-forestry zone located between the outer and inner "polders" (see Fig. 2). Every settler was provided with a slip of land of four hectares in the agro-forestry zone and obliged to plant *Melaleuca* seedlings in two hectares in the inner portion of the slip, while the outer portion could be used for rice. Although the state forest office provided settlers with subsidies to plant *Melaleuca*, tree plantations in the agro-forestry zone did not proceed as expected, because settlers preferred the quick gains derived from rice cultivation to the long wait for gains from *Melaleuca* forestry scheme. The state forest office continued to plant *Melaleuca* in the forest reserve and the recovery of natural vegetation was also brought about by strict

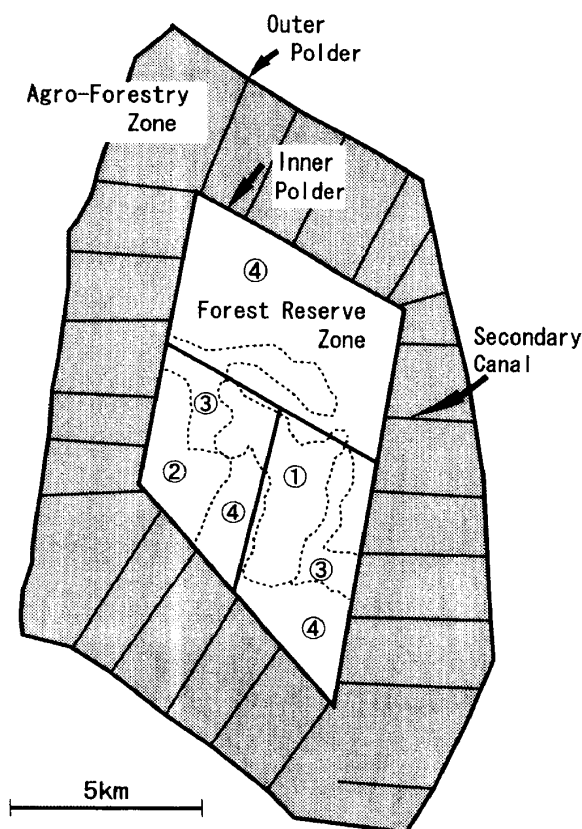


Fig. 2 The Plan of State Forest in U Minh Thuong as of 1994

Source: Derived from the map of U Minh Forest Conservation and Protection Office

Notes: The number in the map indicates original *Melaleuca* vegetation (①); vegetation in recovery (②); younger vegetation in recovery (③); and grassland of reeds (④); respectively.

protection of that zone. As a result, a sharp contrast in land-use between the two zones appeared in the late 1990s: vast rice fields in the outer zone and dense *Melaleuca* forest in the inner zone. It is still a hard task for the state forest office to expand *Melaleuca* planting in the agro-forestry zone, which is expected to be a buffer to protect the forest reserve zone.

In general, *doi moi* transformed the socialist state farm into a sort of cooperative, which members had to manage and sustain by their own initiative. Farms unable to continue the operation were abandoned, their land divided and distributed to the members as described above. However, farms implementing the *Melaleuca* reforestation scheme were seeking a different way to survive. It was expected that the conservation of forests and swamp lowlands could pave the way for the survival of state farms.

As shown in Fig. 3, a number of state farms in the Plain of Reeds with a combined total area of about 10,000 hectares were reorganized into an agriculture and forestry corporation in 1985. However, it did not function well, and about 7,600 hectares consisting of *Melaleuca* and swamp grassland were transferred to the local government and enclosed as a natural reserve in 1990. The remainder of the farm, about 2,400 hectares, continued to be used for rice cultivation after the division, was subdivided into smaller plots and released to farmers in 1994, and has been developed as productive rice land. The natural reserve was transferred to the central government in 1994 to protect the aqua-

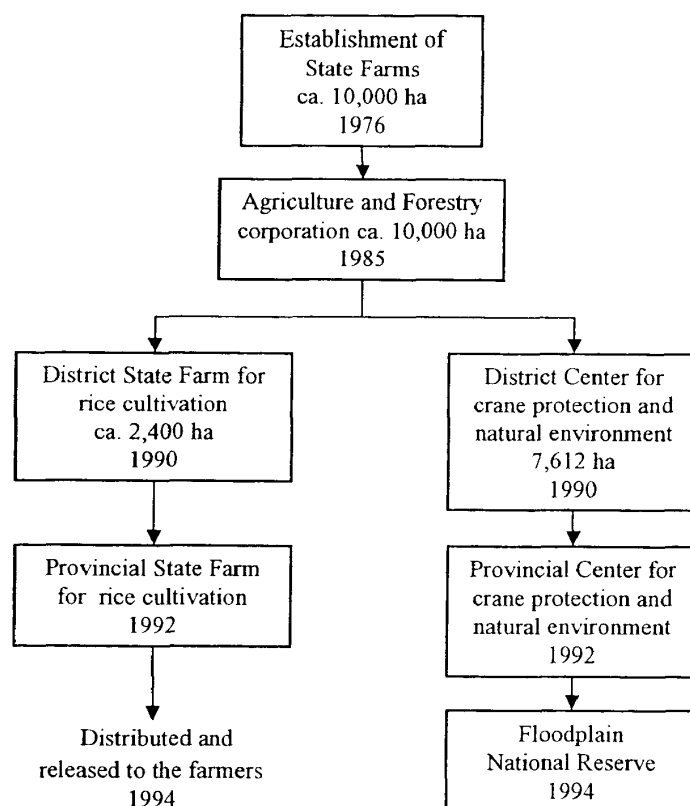


Fig. 3 Transformation of a State Farm Established in the Plain of Reeds

flora and avifauna, and both the local and central governments are seeking a way to maintain the reserve through eco-tourism. Although seemingly stable, it was also reported that encroachment or illegal exploitation of the reserves was often taking place.

Another example of survival is the conversion of state farms to joint-venture commercial forestry enterprises with the participation of foreign companies. State farms established in the northern part of the coastal plain in Kien Giang province, as shown in Fig. 1, were transferred *en masse* to a joint enterprise with a foreign private company in 1990. *Melaleuca* and *Eucalyptus* trees began to be planted in 1991 with the objective of exporting pulp chips. According to a manager of the plantation, although the scale of the enterprise was to have been 60,000 hectares at the initial stage, the final contract between the government and the foreign counterpart was a 35-year lease for 45,000 hectares.

IV Concluding Remarks

As the cases examined in the foregoing sections indicate, rice cultivation in the Plain of Reeds and the Broad Depression has been developed to a great extent following migrants' preferences in combination with government initiative, despite the adverse en-

vironmental conditions of the areas. The increase in the area and production of rice cultivation has been remarkable, especially after the *doi moi* policy was implemented. On the other hand, the planting of *Melaleuca* was promoted mainly by the government as compensation for the failures of state farms. When these two main measures are compared, it seems that local people are not entirely in agreement with government initiatives to extend *Melaleuca* planting. Not often, but sometimes, encroachment on the protected reserves still takes place, and as long as such disturbance occurs, land use in the Plain of Reeds and the Broad Depression cannot be said to be stabilized despite the surprisingly rapid development of rice cultivation that has been achieved under such adverse conditions.

The canals excavated to develop rice cultivation in the past and now dividing the *Melaleuca* plantings from the rice fields seem to have become a new, symbolic frontier line across which government and farmers confront each other. The goal of harmonious coexistence of state and individual property [Feeny *et al.* 1990] still seems remote.

Acknowledgements

Field surveys were conducted with the financial support of a grant-in-aid for scientific research provided by the Monbusho in the fiscal years 1995 through 1997, and I would like to thank Prof. Takada Yoko, the team leader of the research project, for giving me the opportunity to receive this support. In Vietnam, I would first of all like to express my gratitude to Prof. Vo-Tong Xuan of the Mekong Delta Farming Systems Research and Development Institute, and Dr. Nguyen Huu Chiem and the staff of the Department of Environment and Natural Resources Management of Cantho University for their sponsorship and collaboration. Thanks are also due to the government officers at all levels in Dong Thap and Kien Giang provinces and the migrants and farmers who shared their experiences and the pleasant times when I carried out field surveys in the Plain of Reeds and the Broad Depression. In Kyoto, I am grateful to Dr. Deanna Gail Donovan for her useful suggestions for revisions of the manuscript.

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